

## **COSMOS**

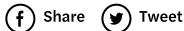


Cosmos » People » Research suggests our preferences for smells aren't determined by cultural factors

5 April 2022 / Matilda Handsley-Davis

### Research suggests our preferences for smells aren't determined by cultural factors

The nose knows.







Credit: Laura Olivas / Moment / Getty Images.

**MORE ON:** 

Think you can hear a smile? Check your cheeks

A formula for simulating softness

How do our brains process smell?

The science behind our sense of touch

2021 Nobel Prize-winners announced

The results of <u>a new international study</u> on smell perception show that people around the world tend to like and dislike similar smells, regardless of their lifestyle and their cultural background.

The study, published today in the journal *Current Biology*, asked 235 people to rank 10 odour molecules on a scale of most pleasant to <u>most unpleasant</u>. The molecules were diluted in mineral oil and presented to participants using odour dispensing devices that resemble felt-tip pens (known by the brand name "Sniffin' Sticks").

The molecules included vanillin, which smells like vanilla, ethyl butyrate, which smells like pineapple or peach, and isovaleric acid, which smells like sweaty feet.

The participants were from three continents – North America, South America, and Asia – and their cultural backgrounds were different. Those questioned included industrialised city dwellers from New York City, Mexico City and Ubon Ratchathani in Thailand, as well as people living traditional agricultural or hunting, gathering and foraging lifestyles.



Vanillin, the main component of the scent of vanilla beans, was the most popular odour molecule in the study. Credit: Pierre-Yves Babelon / Moment / iStock.

"We wanted to examine if people around the world have the same smell perception and like the same types of odour, or whether this is something that is culturally learned," explains Artin Arshamian, the lead author of the study and a researcher in clinical neuroscience at Karolinska Institutet in Sweden.

"Since these groups live in such disparate odiferous environments, like rainforest, coast, mountain and city, we capture many different types of 'odour experiences'," he adds.

Get an update of science stories delivered straight to your inbox.
☐ Get a daily dose of science
☐ Get "Cosmos Catch-up" (every Tuesday)
Your email address
SUBMIT

#### Smell perception: a common winner

The study found that, in general, people from all groups tended to rank the smells in a similar order. The most popular smell overall was vanillin, while isovaleric acid came last. This suggests that odour preference may be universal in humans, rather than shaped by cultural differences.

Supporting this interpretation, the researchers found that the mean rank similarity of the odour pleasantness rankings for pairs of people within the same cultural grouping was only slightly higher than that for pairs of people across different cultures ( $\tau$ =0.32 versus 0.28). In other words, people from the same cultural grouping didn't tend to be significantly more similar than those from different cultures in how they assessed the smells.



Isovaleric acid, said to smell like sweaty feet, was the least popular smell across study participants from around the world. Credit: Rudigobbo / iStock / Getty Images.

So, if our cultural background doesn't play a big role in shaping what smells we like or dislike, what does?

The research team reported that personal preference explains about 54% of variation in their dataset, but a close second was the molecular structure of the odour molecule, which explained 41% of variation.

To further investigate the role of molecular structure, the team created a machine-learning model that would try to predict how pleasant an odour was, based on the molecule's chemical structure. To build the model, information on the chemical structure and pleasantness (as ranked by US research participants) of 466 other odour molecules was used. The researchers then tested the model on the 10 odour molecules used in their study and found that the model's predictions of "pleasantness ranking" correlated strongly with their experimental results. This supports the hypothesis that the chemical structure of odour molecules helps determine how pleasant humans find them.

"Now we know that there's universal odour perception that is driven by molecular structure and that explains why we like or dislike a certain smell," Arshamian says.

"The next step is to study why this is so, by linking this knowledge to what happens in the brain when we smell a particular odour."

Originally published by Cosmos as Research suggests our preferences for smells aren't determined by cultural factors



#### Matilda Handsley-Davis

Matilda is a science writer at Cosmos. She holds a Bachelor of Arts and a Bachelor of Science (Honours) from the University of Adelaide.

#### Read science facts, not fiction...

There's never been a more important time to explain the facts, cherish evidence-based knowledge and to showcase the latest scientific, technological and engineering breakthroughs. Cosmos is published by The Royal Institution of Australia, a charity dedicated to connecting people with the world of science. Financial contributions, however big or small, help us provide access to trusted science information at a time when the world needs it most. Please support us by making a donation or purchasing a subscription today.

**MAKE A DONATION** 







COSMOS WEEKLY Critical opportunity: supplying the substances needed to drive a renewable-energy world



#### AI-based traffic control gets the green light

**Technology** 

The workplace in 2030

**People** 

Joe Rogan: 5 guests who helped share science (and 3 who didn't)

**Culture** 

#### **POPULAR**

Duetting wrens sing with telepathic link

**Biology** 

Will Australia play host to Jurassic Park?

**Evolution** 

Archiving the orchestra of the ocean

**Marine life** 

## **COSMOS**

Shop
About Us
FAQ
Submissions

Terms of use Schools Donate Contact us

'Cosmos' and 'The Science of Everything' are registered trademarks in Australia and the USA,

and owned by The Royal Institution of Australia Inc.



# The Royal Institution of Australia

T: 08 7120 8600 (Australia) +61 8 7120 8600 (International) Customer Service 9:00 am — 5:00 pm ACST Monday to Friday

info@cosmosmagazine.com

PO Box 3652, Rundle Mall SA 5000, Australia

55 Exchange Place, Adelaide SA 5000, Australia

## Get an update of science stories delivered straight to your inbox.

- Get a daily dose of science
- Get "Cosmos Catch-up" (every Tuesday)

Your email address

**SUBMIT** 











